WHAT IS CLAIMED IS:

1. An apparatus for use within an internal combustion engine having an engine block with a block connection surface and a cylinder bore; an engine head with a head connection surface wherein the engine block and the engine head are connected to one another along their respective connection surfaces; a cylinder sleeve with an outer surface portion wherein the cylinder sleeve is mounted to the cylinder bore; and a reciprocating piston positioned within the cylinder sleeve; the apparatus comprising:

a plate connectable between the block connection surface and the head connection surface for substantially overlaying the block connection surface and for substantially underlaying the head connection surface, wherein said plate has a boss portion and wherein said boss portion is mounted substantially around and laterally supports the cylinder sleeve outer surface portion.

2. The apparatus of claim 1 further comprising:

a means for transferring heat away from the cylinder sleeve using said plate.

3. The apparatus of claim 2 wherein said means for transferring heat includes a plurality of cooling openings in said boss portion for cooling fluid communication and flow between the engine block and the engine head and through said cooling openings.

4. The apparatus of claim 3 wherein the plurality of cooling openings forms a circularly spaced array around said cylinder sleeve.

5. The apparatus of claim 3 wherein said means for transferring heat includes a channel in said boss portion for cooling fluid communication and flow between said plurality of cooling openings.

6. The apparatus of claim 1 wherein said plate includes a plurality of hardware passage openings for mechanical communication and hardware passage between the engine block and the engine head and through said hardware openings.

7. The apparatus of claim 1 wherein said cylinder sleeve defines a sleeve axis and said plate is movable in the direction of said sleeve axis relative to said cylinder sleeve.

8. The apparatus of claim 1 further comprising:

a head gasket, wherein said cylinder sleeve has a sleeve upper surface portion and said head gasket is positioned between said sleeve upper surface portion and the engine head, and said head gasket is further positioned between said plate and the engine head.

9. The apparatus of claim 1 further comprising:

a lower gasket positioned between said sleeve outer surface portion, said plate and the engine block.

10. An apparatus for use within an internal combustion engine having an engine block with a block connection surface and a cylinder bore; an engine head with a head connection surface and a cylinder cover wherein the engine block and the engine

head are connected to one another along their respective connection surfaces; a cylinder sleeve with an outer surface portion wherein the cylinder sleeve is mounted to the cylinder bore and positioned below the cylinder cover; and a reciprocating piston positioned within the cylinder sleeve wherein the piston, the cylinder sleeve and the cylinder cover define a combustion chamber; the apparatus comprising:

a plate connectable between the block connection surface and the head connection surface for substantially overlaying the block connection surface and for substantially underlaying the head connection surface, wherein said plate has a boss portion and wherein said boss portion is mounted substantially around and transfers heat away from the cylinder sleeve outer surface portion.

11. The apparatus of claim 10 wherein the coefficient of thermal conductivity of said boss portion is greater than the coefficient of thermal conductivity of the cylinder sleeve.

12. The apparatus of claim 11 wherein the coefficient of thermal conductivity of said boss portion is greater than 36.

13. The apparatus of claim 11 wherein the coefficient of thermal conductivity of said boss portion is approximately 247.

14. An apparatus for supporting cylinder sleeves in a multi-cylinder reciprocating piston internal combustion engine having an engine block and an engine

head, wherein the cylinder sleeves have sleeve outer surface portions, the apparatus comprising:

a support member secured between the engine block and engine head having a base portion and a boss portion wherein said boss portion receives and laterally supports the sleeve outer surface portions of said cylinder sleeves.

15. The apparatus of claim 14 wherein said boss portion transfers heat away from the sleeve outer surface portions.

16. The apparatus of claim 15 wherein said boss portion includes a plurality of cooling openings for cooling fluid communication and flow between the engine block and the engine head and through said cooling openings.

17. The apparatus of claim 16 wherein said boss portion includes a channel for cooling fluid communication and flow between said plurality of cooling openings.

18. The apparatus of claim 14 wherein said base portion includes a plurality of hardware passage openings for mechanical communication and hardware passage between the engine block and the engine head and through said hardware openings.

19. The apparatus of claim 14 wherein said cylinder sleeves define a vertical axis and said support member is movable in the direction of said vertical axis relative to said cylinder sleeves.

20. The apparatus of claim 14 further comprising:

a head gasket, wherein said cylinder sleeves have sleeve upper surface portions and said head gasket is positioned between said sleeve upper surface portions and the engine head.

21. The apparatus of claim 14 further comprising:

a lower gasket positioned between said sleeve outer surface portions, said support member and the engine block.

22. The apparatus of claim 14 wherein said cylinder sleeves are an array of sequentially adjacent, substantially parallel cylinder sleeves wherein each cylinder sleeve is mated with the sequentially adjacent cylinder sleeve.

23. An apparatus for use within a reciprocating piston internal combustion engine having a cylinder sleeve mounted to an engine block and an engine head mounted to the engine block, comprising:

means for maintaining a specified separation between the engine block and the engine head using a plate mounted between the engine block and the engine head wherein the plate is further mounted to the cylinder sleeve;

means for cooling the cylinder sleeve using the plate; and

means for minimizing lateral deformation of the cylinder sleeve using the plate.

24. The apparatus of claim 23 wherein the cylinder sleeve defines a sleeve axis and the plate is movable in the direction of the sleeve axis relative to the cylinder

sleeve.

25. The apparatus of claim 23 wherein said means for cooling includes a plurality of openings in the plate wherein the openings provide fluid communication and flow between the engine block and the engine head through the openings.

26. The apparatus of claim 23 wherein said means for cooling includes a plate with a coefficient of thermal conductivity greater than the coefficient of thermal conductivity of the cylinder sleeve.

27. A method of modifying an internal combustion engine with an engine block, an engine block head-mounting portion, a cylinder sleeve mounted within the engine block, an engine head, and engine head block-mounting portion, wherein the engine head block-mounting portion is mounted to the engine block head-mounting portion, the method comprising:

removing the cylinder sleeve from the engine;

installing a replacement cylinder sleeve in the engine;

maintaining a particular separation between the engine block head-mounting portion and the engine head block-mounting portion with a plate that includes a boss portion, wherein the plate substantially underlays the engine head block-mounting portion; and

restraining the replacement cylinder sleeve from deformation with the boss portion of the plate.

28. The method of claim 27 further comprising

transferring heat from the replacement cylinder sleeve with the boss portion of the plate.

29. The method of claim 27 further comprising

removing a planar portion of the head mounting portion of the engine block.

30. A method of modifying an internal combustion engine having a cylinder block with combustion cylinders at spaced sites therein and a first set of cylinder sleeves secured in said cylinders, the method comprising:

removing the sleeves of said first set from the block and thereby providing at said sites, cylindrical wall surfaces to receive sleeves of a new set, said cylindrical wall surfaces having spaced parallel axes;

providing upwardly facing ledges in said block at the said sites from which the sleeves of said first set have been removed;

taking a new set of sleeves, each sleeve of the new set having upper and lower ends and cylindrical upper and lower wall portions adjacent said upper and lower ends, respectively, the upper wall portion being of greater outside diameter than the lower wall portion thereby providing a downwardly facing shoulder surface extending radially inward from said upper wall portion to said lower wall portion;

installing said sleeves of said new set in said sites with said shoulder surfaces engaging said ledges and limiting the projection of said sleeves into said block;

taking a plate having upper and lower surfaces and apertures therein, with a boss projecting downward from said lower surface, said boss having an inner perimetrical surface and an outer perimetrical surface; and

mounting said plate on said block, with said boss projecting into said block and having said inner perimetrical surface of said plate disposed in at least partially encircling and abutting engagement with said upper portions of said sleeves, and having said outer perimetrical surface abuttingly engaging portions of said block diametrically opposite locations of abutting engagement of said inner perimetrical surface with said upper portions of said sleeves whereby said upper portions of said sleeves are laterally supported by said block through said boss.

31. The method of claim 30 and wherein:

said plate has an upper surface, and said plate is mounted on said block so that said upper surface is below a plane containing the upper ends of said sleeves, whereby the upper ends of said sleeves project above said upper surface of said plate.

32. The method of claim 30 and wherein said block has a flat top surface portion lying in a first plane, and

said upwardly facing ledges are provided by counter boring said block on the axes of said cylindrical wall surfaces to the level of a second plane below said first plane.

33. The method of claim 30 and wherein said sleeves of said new set are installed by press fitting said sleeves into said cylindrical wall surfaces of said block at said sites.

34. The method of claim 33 and wherein said sleeves are pressed sufficiently far into said cylindrical wall surfaces to locate said upper ends in a third plane spaced above said first plane.

35. The method of claim 34 and wherein:

said plate has a top surface; and

said plate is mounted on said block with said top surface in a fourth plane below said third plane.

36. The method of claim 34 and further comprising:

installing a gasket on top of said plate and said upper ends of said sleeves;

installing a cylinder head on top of said gasket and compressing said gasket between said head and said plate, and compressing said gasket between said head and said upper ends of said sleeves with greater force per unit area of said gasket than the compression of said gasket between said head and said plate.

37. The method of claim 30 and further comprising:

prior to mounting said plate to said block, installing a first gasket atop said block;

then mounting said plate atop said first gasket;

installing a cylinder head on said plate; and

securing said head to said block with the upper ends of said sleeves sealed to said head.

38. The method of claim 37 and further comprising:

prior to mounting said head to said plate, placing a second gasket between said upper ends of said sleeves and said head and between said plate and said head for sealing around fluid communication passageways between said head and said block through said plate and said gaskets; and

after mounting said first gasket to said block, projecting said boss through at least one opening in said first gasket to place said boss in position providing abutting engagement of said outer perimetrical surface of said boss with said block and thereby providing said lateral support of said upper portions of said sleeves by said block.

39. The method of claim 38 and further comprising:

selecting said gaskets such that said first gasket is more compliant than said second gasket and accommodates limited relative movement between said plate and said block as said head is secured to said block, and thereby effects greater compression per unit area of said second gasket between said head and the said upper ends of said sleeves than the compression per unit area between said head and said plate.

40. The method of claim 30 and further comprising:

flowing coolant to one of said head and said block, from the other of said head and said block, through openings in said boss, and thereby cooling said upper wall portions of said sleeves.

41. A multi-cylinder internal combustion reciprocating engine comprising:

a cylinder block having a top face in a plane;

said block having a plurality of cylinder tubes having parallel cylindrical axes perpendicular to said plane, and having top ends in a second plane parallel to and below said first plane;

a plurality of cylinder sleeves for receiving reciprocating engine pistons therein, one of said sleeves being secured in each of said cylinder tubes, each sleeve having an upper end and a bottom end, with the upper ends in a third plane parallel to and above said first plane;

each of said sleeves having an outer cylindrical wall having an upper portion extending down from said upper end and having a lower portion extending up from said bottom end, the upper portion having a greater diameter than the lower portion thereby providing at least one abutment surface in said outer cylindrical wall;

a support plate on said block and having an inner perimeter surface snugly engaging said upper portions of said sleeves.

42. The engine of claim 41 and wherein:

said support plate has an upper face and a lower face, and a boss projecting downward from said lower face and forming said inner perimeter surface, and said boss having an outer perimeter surface engaging said block for transmitting heat from said sleeves to said block.

43. The engine of claim 42 and wherein:

said boss has a plurality of circularly-spaced openings extending from said top surface to the bottom of said boss for passage of coolant from said block through said openings to said head.

44. The engine of claim 43 and wherein:

said boss has a plurality of slots extending laterally through said boss from said outer perimeter surface to said inner perimeter surface and communicating with said openings for communication of coolant from said openings with said outer cylindrical walls of said upper portions of said sleeves.

45. The engine of claim 44 and further comprising:

a groove in the outer perimeter surface of said boss and intercepting at least some of said slots and some of said openings and facing said block and providing communication of coolant through said slots and said groove directly between said upper portions of said sleeves and said block.

46. The engine of claim 41 and wherein;

said plate and said boss are one homogeneous piece of material.

47. The engine of claim 41 and wherein:

the material of said plate has a greater heat transfer coefficient than the material of said sleeves.

48. The engine of claim 47 above and wherein:

the material of said plate is aluminum, and

the material of said sleeves is ductile iron.

49. The engine of claim 42 above and wherein:

said plate outer perimeter of said boss has portions directly engaging said block at locations diametrically opposite portions of said inner perimeter surface of said boss directly engaging said outer cylindrical surfaces of said upper portions of said sleeves for direct heat transfer from said sleeves through said boss to said block.